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southern drainage of the Missouri River. Simpson reports it for the Mississippi drainage generally. A three hundred mile survey of the Osage River, beginning at the headwaters, reveals the shell of this species in all its external form and nacre-color extending to *granifera* and even including *Pleth. cooperianus*. Variation in nacre-color for this species is remarkable; however, this deviation from the unipurple nacre of the type may be due to local reaction since it is most noticed in the Osage below the region of medicinal springs. Its favorable habitat is that of rocky shoals, but is occasionally found in deep, quiet water with mud bottom where it acquires a smoother, heavier and less inflated shell. The writer has had the good fortune to secure, *for the first time, several individuals gravid with mature glochidia.* The larva is found to be somewhat smaller than that of *R. granifera* and with hinge line shorter and straighter; as to form, and even as to size, it is hardly distinguishable from *granifera* when allowance is made for variation in a large series. This glochidium is *figured and described here for the first time* (See *Plate I, Fig. 4*). It is observed by the writer to be gravid from June until the middle of August, bearing ripe glochidia mostly about the middle of July. It is decidedly a short period breeder.

(To be continued.)

ENUMERANTUR PLANTAE DAKOTAE SEPTENTRIONALIS VASCULARES.—I.

ENUMERAVIT J. LUNELL.

The Vascular Plants of North Dakota.—I.

With Notes by J. Lunell.

INTRODUCTORY.

The statements and data furnished in the following series of papers are derived substantially from a twofold origin: (1) *My own herbarium*, a part of which contains the visible results of my wanderings in this state during the years of 1889 to 1914 (except 1897 and 1903, when field work in the state of Oregon and in Europe attracted my exclusive attention); and (2) *My Panama-Pacific Exposition Herbarium of North Dakota*, which contains a rich supply of its own habitational informations, and whose title and origin therefore no doubt deserve a brief explanatory mention here, especially as it never was sent to said exposition.

In December 1912 I was requested by Gov. Burke's Panama-Pacific Commission to appear before it on a certain evening in the city of Grand Forks. The commission expressed as its opinion that a representation of the natural plant wealth of the state would constitute an excellent exhibit, and decided unanimously to recommend me to be trusted with the creation of such an exhibit. In my reply of acceptance, I promised that the best duplicates in my exchange herbarium would be available for this purpose, and that I, in order to fill existing vacancies in said herbarium and increase the value and completeness of the exhibit would during the green seasons of 1913 and 1914 visit suitable localities within the state, where I knew the required plants were growing. Also a sum as remuneration for my expenses and services was fixed. My work was commenced immediately and continued without interruption almost until January 1915.

After a short life of a few weeks the commission expired and was supplanted by another one of republican denomination. This commission ought to have taken into consideration that I was working in good faith and would continue so until advised to the contrary. If there was any chance for alteration or overturn of the recommendation made by the first commisssion, the new body ought to have forewarned me early, in order to save me from futile investments of time, work and funds. But it kept an obstinate silence until I had finished my object—a task of two years' duration—and then decided to ignore the recommendation made by its predecessor. My exhibit was not industrial, no dollar-maker, but it had been originated by no action, no scheme of mine, and it possessed a permanent value, far above the ephemeral ones illustrative of the majority of exhibits prevalent at fairs of this brand.

In 1900, under the auspices of the North Dakota Agricultural College was published: "A Preliminary List of the Spermatophyta, Seed-bearing Plants of North Dakota, by H. L. Bolley and L. R. Waldron," containing 775 species and varieties. A revision of this list, called: "Check List of North Dakota Plants, Ferns and Flowering Plants, North Dakota Agricultural College Herbarium, Bolley and Bergman, compiled by G. F. Bergman (after Britton's Manual)," not dated, appeared I believe in 1913. To the number of species and varieties, contained in the first list, had been added 187, making a total of 962. The present list of mine, being the third of its kind, contains about 1150 numbers, some 800 of which are found in the two previous lists, being an addition of 350 numbers not listed before, and raising the total number for this state discovered until the present time (May 1915) to at least 1300. My field of work has been mainly the Lake region, this being without contradiction or doubt the most important and the most prolific part of the state botanically, all the new forms whatever of plant life (with one or two exceptions), which have been found within the state, belonging here. A moderate, conservative estimate would raise this present number of 1300 up to the two thousand, even now, since the "improvement" work has gone on recklessly for many years. When I, 26 years ago, commenced my collecting in this state, it must have be n considerably higher than now, to deem from the number of species believed to be extinct.

It would hardly be recommendable to delay the publishing of these papers until the names of those supposed-to-be-700 plants could be added. It is fain to predict that this number will never be reached. Too much ground has been ploughed, the beautiful natural groves have been transformed into pastures and hog pens, the fast evaporation from the areas laid open, and the quick absorption by the latter of rain and melting snow leave no surplus to be drained off into the sloughs and the coulées, these are almost all dry, even in the early spring, lakes a few years ago covering square miles have vanished, and our largest water main, Devils Lake, is disappearing fast. The semi-aridity of the country seems to be increased in direct proportion to the breaking of the virgin prairies. Still, a paternal legislature, in spite of the steadily growing difficulties in providing means for paying the regular budget, has just seen fit to vote $60,000 for the promotion of immigration, and the likely-to-be-added population will in all probability direct its first efforts to the quick overturning of the remaining intact portion of the prairie. Of all menaces to the continued propagation of the native flora this change in soil conditions is the worst, the most destructive.

And these 700 plants can not be found without the cooperation of collectors. The federal government furnished botanists when surveying the country, and got up a representation of the common plants growing everywhere, but it is self-evident that almost all the rare plants—the plants which are found after visits to a place repeated for the tenth, or the hundredth, or perhaps the thousandth time—could not be noticed in the collected material. The government's activity ends here, and would certainly not be extended to taking any part in the collection of the 700 plants.

Turning our attention to the large public or private institutions, some of them, often commanding almost unlimited funds, are in the habit—when it is desired to make a study of some special plant or plant group—of sending circulars to botanists, requesting them to "give up" what they have on hand or to collect the desired plants for them. In the majority of cases the botanist so addressed will "for the best interests of science" yield, and some will even find the proposition immensely flattering to themselves! There are perhaps a few who would say that they are willing to fulfil the request, if the institution pays the cash expenses necessarily connected with it, but such a proviso will upset the whole plan. It is deemed unwise to use the funds of the institution for such a purpose (why pay for something that can be had for the asking?), and the scheme is dropped. Some institutions make their requests for material most valuable to them with "thanks," others do not even send an acknowledgement when they have received the goods. The most generous of the institutions return duplicates of equal or sometimes higher quality than the material received had, others use the occasion to unload the most repugnant and worthless trash, others again admit being in debt and promise payments in plant duplicates, but these are never sent. Still others pay their indebtedness by incorporating and matriculating the received specimens as gifts, and immortalize the donator by adding his name in a special column and opposite the other annotations, thus substituting stones for bread! Some other more substantial means are certainly needed for the discovery of our 700 plants!

It remains to be ascertained, if the conditions within our own state are more favorable for the reaching of this end. The state has a geological survey with a staff botanist, whose salary is supposed to be reimbursed to the farmers by the increase in profits from their land derived from the knowledge of the plants growing on it in its virgin condition. The reports of the government survey ought to be available, and some additional knowledge can certainly be expected from a second survey, but its scope is confined to the common plants. Almost all of the rare plants will remain undiscovered. The place needing weekly visits for years can not reveal its secrets on the very day when the surveyor scans it. When writing this I have before me Public Document No. 45 with a report of a survey from Williams County. This gives 236 as a total of plants found. There is no doubt in my mind that at least twice this number could easily be collected within the area, and at the same time that there is no neglect on the part of the botanist. Wherever he went, he certainly collected all there was to collect. Another striking fact is, that out of these 236 species all but 23 (*i. e.*, 90 per cent) are common plants in my home corner, 200 miles to the east of Williams County, and to an overwhelmingly large extent probably in almost all the other parts of the state. A home botanist with an ordinary imagination would no doubt be able to make out a correct list of plants growing inside of any county not visited by him, with the exception of the rare or comparatively rare plants, of course. I would predict, that a majority of the 700 undiscovered plants would remain hidden for 100 years to the botanist-surveyor! I have learned, that this survey has not been at work recently.

It is surprising to me that so few people of means turn their attentions to the accumulation of botanical objects with their unlimited multiplicity, in place of storing buttons, canes, smoking pipes, stamps, etc. There are few things if any, so beautiful, so fascinating as an artfully preserved herbarium plant. To the true botanist the joy of collecting surpasses all other joys. The rich man can use his time as he pleases and could easily amass in one year a plant wealth larger than another mortal could accumulate in a lifetime. Is there any prospect that it would arise in this state a rich man turning his mind to the wild-flowers and taking up the task of trying to find those 700 plants unrevealed yet to all?

At the present there is, if I am not incorrectly informed, no field work done within the state, except by Prof. O. A. Stevens, representing the Agricultural College, by Dr. J. F. Brenckle of Kulm, N. Dak., whose excellent work in mycology, made public in his *Fungi Dakotenses*, can not be overestimated, and by the writer. Prof. Stevens, having enjoyed the liberty of choosing his own places for field research, has had some striking and even astonishing results. My good fortune has always guided me to find places of exceptional value to the botanist. During my wanderings I have often happened on plants, either immature or overripe, the proper time for their collection being so far in the past or in the future, that their places in the system could not be properly set down. They are scattered widely apart in the state, and each of them needs its individual attention on a certain date of the season, and on a certain place. I am loth to leave them alone, and I would not do so, were it not for more or less apparent reasons, hinted at in these pages or readable between the lines. The summers yet allotted to me on this planet of ours would perhaps give me enough of time for finishing this work, and I would spend them on nothing in the world more agreeable and more preferable to myself.

Dr. Brenckle necessarily paying almost his entire attention to fungi, I myself being on the verge of actual or partial or fancied retirement from botanical field work, and Prof. Stevens likely alone upholding this branch of study within the state, what are the present prospects for the discovery of those remaining 700 vascular plants? If it becomes possible for Prof Stevens to avoid the lurking rocks of politics and continue the work incessantly for a life time, he will certainly discover a considerable part of them.

Thus, being temperamentally not oversanguinely hopeful, I believe that the most prudent way is to distrust the uncertain future and publish the results attained so far.

My list contains mainly names of plants collected by myself, and where other botanists have contributed, they have been invariably credited for it. About 150 species, contained in the Agricultural College lists, have been omitted for the sole reason, that I have had no occasion to look at them. I do by no means charge that they have been wrongly identified.

In the naming of plants which I have considered new I had precious help from my own general herbarium, which offered means of comparison with related species. In a minority of cases the descriptions furnished in manuals and periodicals proffered reasons for segregation sufficient and convincing at least to myself. In a number of instances it has been my enviable luck that Dr. Edw. L. Greene placed his immense experience and invaluable advice at my disposal. The changes from the nomenclature hitherto in vogue, the administering of justice botanically, the meting out of his due to everybody have, with the kind consent of Prof. J. A. Nieuwland, been submitted to and supervised and worked out by him, and for the sake of convenience, where the new name differs materially from the one hitherto used, this last has been parenthetically affixed. For the expert identification of a majority of *Cyperaceae* I am under obligation to Mr. K. K. Mackenzie. Likewise it has become a fixed habit of mine to submit a considerable part of my grasses to Prof. A. S. Hitchcock and Mrs. Agnes Chase for determination, from which there is no appeal, as no one would question their finality.

No criticism in this preface shall apply to the brother-botanist who pays his own botanical expenses out of his salary or his private purse. Nothing is too good for him. His wishes are so many laws to me, and I will gladly and without material remuneration extend to him all the help I can, in order to make his road smooth and facilitate his researches.

Any previous names of North Dakota plants for which I am responsible, being not mentioned in this list, and any of my descriptions pertaining to North Dakota plants, being not in conformity with those given in these papers, are herewith repealed.

If some one should conclude that a mind saturated with bitterness and "gall" has dictated these lines and exaggerated this quite gloomy review of existing conditions botanically, he commits himself to a grave error. I have just tried to relate undisfigured facts, with a mind overflowing of tenderness and good will towards all.

Subkingdom PTERIDOPHYTA.

Order I. DORSIFERAE. Rivinus (1690-1699).

Family 1. **OPHIOGLOSSACEAE** Presl. Pterid. 6. (1836).

BOTRYCHIUM Swartz, Schrad. Bot. 2: 8, (1808).

1. **Botrychium virginianum** (Linn.) Swartz. Schrad. Bot 2:111, (1800).

Turtle Mountains: St. John, Dunsieth; Fort Totten. (Bergman).

Family 2. **POLYPODIACEAE** R. Brown, Prod. Fl. Nov. Holl. I:145, (1810).

WOODSIA R. Br. Trans. Linn. Soc. 11: 170, (1812)

2. **Woodsia obtusa** (Spreng.) Torr. Cat. Pl. in Geol. Rep. N. Y. 195, (1840).

Dickinson (Cl. Waldron).

3. **Woodsia oregana** D. C. Eaton. Can. Nat. 2:90 (1865).

Morton Co.: Coffin Butte (Bell).

CYSTOPTERIS Bernh. Schrad. Neues Journ. Bot., I. pt. 2: 26, (1806).

4. **Cystopteris fragilis** (Linn. 1762) Bernh. Schrad. Neues Journ. Bot. l. c. 27, (1806).

In the western part of the State.

Family 3. **MARSILEACEAE** R. Brown. Prod. Fl. Nov. Holl. I:166, (1810).

MARSILEA Linn. Sp. Pl. 1099. (1753).

5. **Marsilea mucronata** A. Br. Amer. Journ. Sci. (II.) 3:55, (1847).

Leeds (extinct); Butte (extinct).

6. **Marsilea oligospora** L. N. Good. Bot. Gaz. 33:66, (1902).

La Moure Co.: Edgeley (Cl. Waldron).

Family 4. **EQUISETACEAE** Mich. Fl. Bor. Am. 2:281, (1803)

EQUISETUM Plinius 1, 26, C. B.

7. **Equisetum arvense** (C. Bauhin) Linn. Sp. Pl. p. 1061, (1753).

Across the state.

8. **Equisetum fluviatile** Linn. Sp. Pl. 1062, (1753).

Leeds, Pleasant Lake.

9. **Equisetum fluviatile limosum** Linn. Sp. Pl. 1062 (1753).

Leeds, Towner, Pleasant Lake.

10. **Equisetum hiemale** var. **affine** (Engelm.) A. A. Eaton in Fern. Bull XI. 75, 111 (1903).

Leeds, Butte.

11. **Equistetum hiemale** var. **intermedium** A. A. Eaton Fern Bull. X., 120. (1902), XI., 108., (1903).

Leeds, Butte; McHenry Co.: Towner, Sand Hills.

12. **Equisteum hiemale f. polystachyon** Prayer in Gilbert, List N. A. Pterid, 8, 26, (1901).

Benson Co. Comstock.

13. **Equisetum hiemale** var. **pumilum** A. A. Eaton, Fern. Bull. XI. 75, 111 (1903).

Leeds.

14. **Equisetum hiemale f. ramigerum** A. Br. in Gilbert,

List N. A. Pterid, 26, (1901). See also A. A. Eaton in Fern Bull. XI., 112, (1903).

Eddy Co., Sheyenne.

15. **Equisetum robustum** A. Br. Engelm. Am. Journ. Sci. 46: 88, (1844).

In the Willow Creek ravine near Dunsieth.

16. **Equisetum pratense** Ehrh. Hannov. Mag. 138, (1784).

Turtle Mountains: near St. John; Pleasant Lake.

Family 5. **SELAGINELLACEAE** Underw. Nat. Ferns, 103, (1881).

SELAGINELLA Beauv. Prod. Aeth. p. 101, (1805).

17. **Selaginella densa** Rydberg. Mem. N. Y. Bot. Gard, I:7, (1900).

Dunsieth, Towner, Minot.

Subkingdom SPERMATOPHYTA.

Class I. GYMNOSPERMAE.

Order I. CONIFERAE. Bellonius (1533), Rivinus (1690-1699).

Family 6. **ABIETIDEAE** S. F. Gray, Nat. Arr. 2,223, (1821).

PINUS Virgilius, Ecl. VII. 56 and Georgica I, 141.

18. **Pinus scopulorum** (Engelm.) Lemmon. Gard. and For. 183, (1897).

Medora (Bergman.)

JUNIPERUS Virgilius Ecl. VII, 53, and Ecl. X. 78.

19. **Juniperus vulgaris** Tragus. Hist. 1074, also Clusius (1601).

Juniperus communis Linn. Sp. Pl. 1040 (1753).

Medora (Bergman).

20. **Juniperus depressa** Raf. Med. Fl. 12, (1830).

Juniperus prostrata Pers. (?).

Dickinson (Bergman).

21. **Juniperus scopulorum** Sargent. Gard. and For. 10:423, (1897).

Medora (Bergman in 1910; Stevens in 1914).

Class 2. ANGIOSPERMAE.

Subclass 1. MONOCOTYLEDONEAE. J. Ray and A. Haller.

Order 6. PANDANALES.

Britton, Man. 2nd ed. p. 38. (1905).

Family 7. **TYPHACEAE** J. S. Hillaire, Expos. Fam. 1, 60 (1805).

TYPHA Theophrastus. Hist. Pl. 4, 11, Dioscorides 3, 123, Plinius, Nat. Hist. 16, 36 and 66, also 19, 2.

22. **Typha palustris** Ruellius Nat. Stirp. p. 560, (1543).

Typha latifolia Linn. Sp. Pl. p. 971 (1753).

Leeds.

Family 8. **SPARGANIACEAE** Agardh, Theor. Syst. Pl 13, (1858).

SPARGANIUM Dioscorides 4, 21.

23. **Sparganium eurycarpum** Engelm. in A. Gray, Man. 2nd. Ed., p. 430, (1836).

Borders of Lake Ibsen (extinct on account of drought); Leeds (a few plants in a roadside ditch).

Order 7. HELOBIAE. *Bartling, Ord. Nat. p.* 70, (1830).

Family 9. **POTAMOGETONEAE** Dumortier, B. C. Flor. Belg. Stam. p. 163, (1827).

24. **Spirillus foliosus** (Raf.) Lunell.

Potamogeton foliosus Raf. Med. Rep. (II.) 5: 354, (1808).

Jamestown (Bergman).

25. **Spirillus Friesii** (Ruprecht) Nwd. Am. Midl. Nat. Vol. III., p. 17 (1913).

Potamogeton Friesii Rupr. Beitr. Pf. Russ. Reichs, 4, p. 43, (1845).

In Lake Ibsen (extinct); Jamestown, in James River.

26. **Spirillus heterophyllus** (Schreb.) Nwd. Am. Midl. Nat. l. c. p. 17, (1913).

Potamogeton heterophyllus Schreb. Spicil. Fl. Lips. p. 21, (1771).

Leeds.

27. **Spirillus natans** (Linn.)Nwd. Am. Midl. Nat. l. c. p. 16, (1913).

Potamogeton natans Linn. Pan. Suec. Am. Acad. II. p. 241, (1749), Sp. Pl. p. 126, (1753).

Wahpeton (Bergman).

28. **Spirillus pectiniformis** (Linn.) Nwd. Am. Midl. Nat. l. c. p. 18, (1913).

Potamogeton pectiniforme Linn. Am. Acad. II., p. 241, (1749). *Potamogeton pectinatus* Linn. Sp. Pl. p. 127, (1753).

Leeds, Lake Ibsen, Devils Lake.—Kulm (Brenckle).

29. **Spirillus perfoliatus** (Linn.) Nwd. Am. Midl. Nat. l. c. p. 17, (1913).

Potamogeton perfoliatus Linn. Am. Acad. II., p. 241, (1749), Sp. Pl. p. 126, (1753).

Leeds.

30. **Spirillus perfoliatus** var. **Richardsonii** (A. Bennett) Nwd. Am. Midl. Nat. l, c. p. 17 (1913).

Potamogeton perfoliatus v. *Richardsonii* A. Bennett.

Leeds. Kulm (Brenckle).

31. **Spirillus Zosteraefolius** (Shum) Nwd. Am. Midl. Nat. l. c. p. 17, (1913).

Potamogenot zosteraefolius Shum. Enum. Pl. Saell. p. 50, (1801)

Lake Ibsen (extinct).

BUCCAFERREA Micheli. Nov. Pl. Gen. 72 (1729).

32. **Buccaferrea maritima** (Linn.) Lunell.

Ruppia maritima Linn. Sp. Pl. p. 127 (1753).

In Devils Lake. This was supposed to be the only vascular plant existing in said lake, but the writer found in 1913 *Spirillus pectiniformis* growing in company with the *Buccaferreae.*

ALGOIDES Vail. A. I. t. 1f. 1, (1719).

Aponogeton Pontedera, Anthologia II., 117 (1720).

Zannichellia Micheli. Nov. Pl. Gen. 71, (1729).

33. **Algoides palustre** (Linn.) Lunell.

Zannichellia palustris Linn. Sp. Pl. p. 127. (1753).

Butte, York, Devils Lake.

Family 10. **JUNCAGINEAE** Rich. also Kunth, Endlicher, (1840).

TRIGLOCHIN C. Bauhin Pinax. p. 6, (1623).

34. **Triglochin tricapsularis** Linn. Am. Acad. p. 245, (1894).

Triglochin palustris Linn. Sp. Pl. p. 338, (1753).

Butte, Towner.

HEXAGLOCHIN (Dum.) Nwd. Nov. Gen. Am. Mid. Nat. Vol. III., p. 19, (1913).

35. **Hexaglochin sexlocularis** (Linn.) Nwd. Am. Midl. Nat. l.c.

Triglochin maritima Linn. Sp. Pl. p. 339, (1753).

Leeds, Thorne, Towner.

Family 11. **ALISMACEAE** D. C. Fl. Fr. 3, p. 181, (1805).

ALISMA (Plinius), Nat. Hist. 1. 25, c 10 et 77, Valerius Cordus (1561).

36. **Alisma Geyeri lanceolatum** (Buchenau) Lunell. Bull. Leeds Herb. 2: p. 5, (1908).

Alisma arcuatum lanceolatum (Buchenau) Lunell, Bot. Gaz. 43, p. 211, (1907).

Alisma Plantago (aquatica) *arcuatum lanceolatum* Buch. in Engler, Pflanzenreich IV. 15, p. 14, (1903).

Leeds, Butte.

37. **Alisma Geyeri pumilum** (Prahl) Lunell.

Alisma arcuatum pumilum Prahl in Kritische Flora 2: 204, (1890).

Alisma Plantago (aquatica) var. *pumilum* Nolte in Sched.,; Sonder, Flor. Hamb. 210, (1851).

Rare. Bottineau along Oak Creek, Leeds.

38. **Alisma Geyeri angustissimum** (Aschers. et Graebn.) Lunell, Bull. Leeds Herb, 2: p. 5, (1908).

Alisma arcuatum angustissimum (Aschers. et Graebn,) Lunell, Bot. Gaz. 43, p. 211, (1907).

Alisma Plantago (aquatica) *arcuatum angustissimum.* Aschers, et Graebn. Synops, Mitteleur, Flora 384, (1898).

Leeds, York.

39. **Alisma Geyeri giganteum** Lunell, var. nov.

Phyllodia 5–7 mm. lata, linearia, phyllodiis varietatis praecedentis duplo longiora. Ubi superficiem rivuli attingunt, extremitates in folia lanceolata, 6–10 cm. longa, 1 cm. lata transmutantur.

Phyllodia 5–7 mm. wide, linear, twice as long as in the preceding variety. There exists in the phyllodia a strong tendency, a tendency to get to the surface of the water, to reach "a place in the sun," and if they succeed, their ends become leaves, lanceolate, 6–10 cm. long and 1 cm. wide.

A large plant, rare. Collected by the writer on July 18, 1906 in running water at Leeds. Extinct in the type locality.

40. **Alisma subcordatum** Rafinesque, in the Medical Repository, Hexade 2, vol. 5, p. 362, (1808).

Alisma Plantago (aquatica) Linn., var. *Michaletii* Aschers, et Graebn., f. *latifolium* Aschers. et Graebn. Synops. Mitteleur. Flora I, 383 (1898), and Bot. Gaz. 43, p. 210 (1907), in part.

We quote from the description of Rafinesque: "—radical leaves petioled, semi-cordate, very obtuse, flowers in a very loose panicle, verticillated by threes. Common almost all over the United States of America, where it is mistaken for the Alisma plantago of Europe, which is widely different, having quite lanceolated leaves, very acute."

Both species have flowers 4–8 mm. in diam., or petals 2–4 mm. in length. The *A. plantago* thus described is common on the European continent, but the writer collected in 1897 on an island in the Baltic Sea a specimen, which can not be differentiated from *A. subcordatum*, having broadly ovate, semi-cordate, obtuse leaves. This leaf form is the same in

41. **Alisma subcordatum superbum** Lunell.

Alisma superbum Lunell in Bull. Leeds. Herb. 2: p. 5, (1908), but its flowers are larger, 1–1.2 cm. in diam., petals 5–6 mm. in length.

42. **Alisma subcordatum stenophyllum** (Aschers. et Graebn.) Lunell.

Alisma Plantago (aquatica) Linn. var. *Michaletii* Aschers. et Graebn., f. *stenophyllum* Aschers. et Graebn.. l. c. 383, and Bot. Gaz. 43, p. 210 (1907), in part.

Has flowers of the same size as the species, but the leaves are lanceolate.

The varieties of *A. subcordatum* are found merely occasionally, but the species is abundant in wet soil throughout the state.

SAGITTARIA Plinius, Nat. Hist. I: 21, c 17 and 68.

43. **Sagittaria arifolia monomorpha** Lunell in Bull. Leeds Herb. 1, p. 2, (1907).

Leeds.

4. **Sagittaria arifolia stricta** J. E. Smith, Rep. Mo. Bot. Gard. VI. (1894) 8 t. 1.

Occasionally found at Leeds.

45. **Sagittaria arifolia dimorpha** Lunell in Bull. Leeds Herb. 1, p. 3, (1907).

Leeds.

46. **Sagittaria arifolia polymorpha** Lunell in Bull. Leeds Herb. 1, p. 3, (1907).

Leeds.

Natural conditions have so far almost entirely prevented the reappearance of this and the following varieties since the year when I published them (1907).

47. **Sagittaria arifolia cuneata** (Sheldon) Lunell, in Bull, Leeds Herb. 1, p. 3, (1907).

Sagittaria cuneata Sheldon, Bull, Torr, Bot. Club, 20: 283, pl. 159, (1893).

Leeds.

Family 12. **VALLISNERIACEAE** Dumortier Anal. Fam. p. 54, (1829).

PHILOTRIA Raf. Am. Month. Mag. 2, p. 175, (1818).

48. **Philotria canadensis** (Michx.) Britton. Sc. II., 2, p. 15, (1895).

Minot, Jamestown.

OUR BIRDS IN THE WINTER OF 1913-14.

BROTHER ALPHONSUS, C. S. C.

This winter the total number of species exceeded that of the previous one by two species. The totals of each of the months were also larger than those of last winter.—December having 5 more; January, 7 more; February, 5 more. The Cardinal, Meadowlark, Bronzed Grackle, Goldfinch and Screech Owl were not seen last winter; while the Northern Shrike and Herring Gull did not appear this winter.

The weather conditions this year were favorable most of the winter, and to this was due the presence of certain species that had never been recorded before in winter. These were the Meadowlark and Bronzed Grackle. Only for a short time—in early February—the temperature fell below zero, that month having had the smallest number of species.

The Crow had 22 records for December, with the longest interval, 6 days. In January there were 20 observations, the longest absence having been 4 days. February shows the largest record for the species—26 days present, and 3 days, the greatest interval. For the three months the total number of records was 68.

The Blue Jay was found on 25 days in December, with an absence of only one day at any time during the month. The January records reached 26, with the same absence as in December. The cold of February reduced the records of the Jay to 22, with 3 days as the longest interval. The total for the three months was 73 records, the largest number of any species this winter.

This is the first winter I have found the Red-headed Woodpecker as a resident species. Just what caused the bird not to migrate may not be easy to determine. Weather conditions may have had something to do with its staying, as is shown by the